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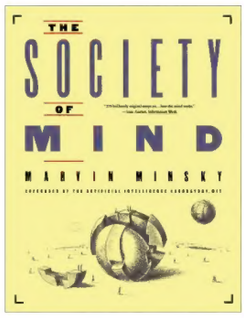
Research Group Projects and Descriptions



Society of Mind
Principal Investigator: Marvin Minsky

The Society of Mind research group focuses on imparting to machines the human capacity for commonsense reasoning. We account for many aspects of commonsense, imagination, and reasoning by analogy as resulting from negotiations among different cognitive processes that use different ways of representing knowledge.

visit the group web site

Architectures for Common-Sense Computing

Marvin Minsky and Pushpinder Singh

We are developing next-generation architectures for artificial intelligence based on Professor Minsky's "Society of Mind" theory of human thinking. The main idea is that the key to human flexibility and resourcefulness is mental diversity: we have many ways to solve every kind of problem, so that when we get stuck trying one method of solution, we can switch to another. We are exploring how this idea can be applied at different places and levels in a cognitive architecture, in order to build systems capable of robust common-sense reasoning.

How Cars Make People Feel

Marvin Minsky and Betty Lou McClanahan

In this project, we want to understand how cars make people feel. What kinds of emotions do they engage and how do these emotions affect our behaviors and attitudes? What are emotions? A theory is that each emotion turns on (and off) a certain collection of "ways to think:" thus, you become a partly different person depending on the emotion that you are feeling. So, what kind of person are you when you jump into your car? Some questions relating to this project are: How do you represent the car in your mind?; How does it change how you represent yourself?; How does it affect your aspirations and your image of what you could become?; What intelligence do you attribute to your car? When cars were horses, each did have intelligence and personality. Soon, our cars could again start to have their own aspirations and personality. What are the "characters" in our cars? The brakes and steering already have traits: dominant and authoritative vs. compliant, submissive, obedient. The ornamentations have emotional meanings in overall shape suggesting posture, attitude, potential. Details, like the fairing around the headlights, suggest personal features.

LifeNet

Pushpinder Singh

LifeNet is a new common-sense knowledge base that captures a first-person model of human experience in terms of a propositional representation. LifeNet represents knowledge as a graphical model relating tens of thousands of egocentric propositions with half a million temporal and atemporal links between these propositions. We built LifeNet by extracting its propositions and links from the Open Mind Common Sense corpus of common-sense assertions, have developed a method for reasoning with the resulting knowledge base, and are building a new Open Mind site to collect more of this type of knowledge.

OMCSNet

Marvin Minsky, Xinyu H. Liu and Pushpinder Singh

Imparting common-sense knowledge to computers enables a new class of intelligent applications better equipped to make sense of the everyday world and assist people with everyday tasks. While previous attempts have

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been made to acquire and structure common-sense knowledge, they have either been inadequate in capturing the breadth of knowledge needed for the enterprise, or their complicated representation schemes have made them difficult to incorporate into applications. Our approach to this problem is OMCSNet, a freely available common-sense knowledge base that possesses a great breadth of knowledge that can be easily incorporated into applications. Built from the Open Mind Commonsense corpus, which acquires common-sense knowledge from a Web-based community of instructors, OMCSNet is a semantic network of 280,000 items of common-sense knowledge, and a set of tools for making inferences using this knowledge.

visit the project web site

Open Mind Common Sense

Marvin Minsky and Pushpinder Singh

The biggest problem facing artificial intelligence today is how to teach computers enough about the everyday world so that they can reason about it like we dp—so that they can develop "common sense." We think this problem may be solved by harnessing the knowledge of people on the Internet, and we have built a Web site to make it easy and fun for people to work together to give computers the millions of little pieces of ordinary knowledge that constitute "common sense," all those aspects of the world that we understand so well that we take them for granted. Teaching computers how to describe and reason about the world—and especially about people and their goals, activities, and interests—will give us exactly the technology we need to take the Internet to the next level, beyond its current state as a giant repository of Web pages, to a new state where it will be able to *think* about all the knowledge it contains; in essence, to make it a living entity.

visit the project web site

Robots with Common Sense

Marvin Minsky and Pushpinder Singh

In order to build machines with common sense we need to find ways to integrate a wide variety of specific ways to represent knowledge, reason with that knowledge, and arrange such resources into a larger architecture. To study this problem we are building a rich, simulated environment in which a pair of simulated robots live and perform various tasks: walking about, manipulating objects, building structures together, and conversing with each other about events in their world.

Society of Mind

Marvin Minsky

Professor Minsky continues to develop the theory of human thinking and learning called the "Society of Mind," which tries to explain how various phenomena of mind emerge from the interactions among many different kinds of highly evolved brain mechanisms. In this way we can account for many aspects of common sense, imagination, and reasoning by analogy, as resulting from negotiations among systems that use different ways of representing knowledge. Similarly, it appears that we can explain many of the regularities found in natural languages as consequences of how those representations work, rather than as constraints that are externally imposed on interpersonal communications. This approach also suggests that some of what we call "emotions" are mechanisms required for managing conflicts among competing goals. We may need to construct similar systems when we begin to build smarter and more versatile machines.

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